HIGH PERFORMANCE DISK COPIER

SECTOR BY SECTOR COPYING

HANDLES NONSTANDARD FORMATS

ALL MACHINE LANGUAGE

SUPERFAST EXECUTION

ONE OR TWO DRIVES

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* COPYCAT *
****

Disk copy utility for Atari computers

by Ralph Jones

COPYCAT

USER INSTRUCTIONS

INTRODUCTION:

COPYCAT is a high-performance disk copy utility for use on any Atari (tm) Personal Computer equipped with one or more Atari 810 disk drives. It has the following special features:

(1) COPYCAT is a self-booting machine language program. In addition to the speed advantage of machine language, this allows it to use the entire memory space of your computer (less the 1300 or so bytes the program takes up, and the display memory) to store data between read and write cycles of the program. By contrast, a BASIC program needs 8K bytes for the BASIC cartridge and 10K for the DOS files. This can save you one read-write "pass" in making your copy disk.

(2) COPYCAT does not abort when it encounters a missing or "unformatted" sector on the original disk; it simply ignores it. The copy disk will have a sector full of zeroes in place of the unformatted sector. (NOTE: Because of an undocumented bug in the disk hardware, some copy programs occasionally fail to copy the first "good" sector after an unformatted sector. COPYCAT deals with this bug by resetting the disk logic after every missing-sector detection.)

(3) COPYCAT reads every sector on the original disk, but only writes to the copy disk the sectors that contain data (in their correct track and sector locations). This means you don't waste your time watching the machine copy fifty thousand zeroes from a short original disk (which most of them are). The Atari DUP does this with DOS-created disks, but as of 2/20/82 only COPYCAT does it with ALL disks.

(4) COPYCAT copies sector 720, which cannot be accessed by the ATARI DOS but can be used by machine language programs.

OPERATING INSTRUCTIONS:

(1) Memorize the following cautions about copying disks:
  (a) Don't copy a disk that isn't write protected.
  (b) Don't ever copy a disk that isn't write protected.
  (c) Don't never EVER copy a disk that isn't write protected.
  (d) If you have backup copies already, you can think about ignoring (a), (b) and (c).

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(4) COPYCAT copies sector 720, which cannot be accessed by the DOS but can be used by machine language programs.

OPERATING INSTRUCTIONS:

(1) If your original disk doesn't have a write-protect label on it, PUT ONE ON NOW! Sooner or later, you will load the right disk at the wrong time and try to write on the original. Depend on it. You will. If it has a write protect, all you will do is bomb COPYCAT and have to start over.

(2) Make sure your copy disk has been formatted. If you use a disk that has data on it from previous use, remember that COPYCAT will not wipe out the existing data in any sectors that don't contain data on the original. If in doubt as to whether this

will cause problems, reformat it.

(3) Remove all cartridges from the computer and boot the COPYCAT disk. The first display you see will ask you how many disk drives you're using. Enter 1 or 2 and hit <RETURN>. With one drive, you will of course have to insert the original and copy disks alternately until the copy is completed; however, you will find many disks will copy in a single pass. If you have two drives, you will be prompted to put the original in drive 1 and the copy disk in drive 2. In either case, just follow the prompts whenever the console bell rings.

(4) At any time during the copy execution, press the "S" or "M" keys to select the (S)ingle or (M)ultiple disk read options depending on the type of disk you are copying and the characteristics of your disk drive. See the discussion of disk operations below for a full description of these options. If you decide that all useful sectors on the disk have been read, press the "Q" key to (Q)uit and finish up the copy disk without copying any more sectors.

(5) When the copy is finished, you will get an "ALL DONE" message. If you want to make another copy, press <SYSTEM RESET> and COPYCAT will run again from the beginning.

A WORD (or 400) ON DISK OPERATIONS:

The requirement to detect and ignore "unformatted" sectors on a disk imposes some difficult problems for two reasons:

(1) Disk drives and operating systems are designed to make SUCCESSFUL accesses. If a disk sector fails to read, the designers usually assume the program will try again or give up and terminate.

(2) Unsuccessful disk accesses occur a LOT of the time, even on perfectly normal sectors. In particular, the earlier Atari 810 drives which do not have the data separator chip have a very significant read-error rate on the inner four or five tracks of the disk. This makes it tricky to distinguish a deliberately unreadable sector from a "hard to read" one.

COPYCAT approaches these problems by providing for a variable number of retries when a sector read fails. It reads the disk one sector at a time and queries the operating system to see if each read was successful. Whenever a read fails, the nature of the error is examined. If it was "device timeout" (meaning the drive could not find the sector after 7 seconds of searching), the program assumes the sector is unreadable and goes on. Otherwise, it checks to see what read mode is in effect. If it is "multiple read" (which is normally in effect when the program starts), the read will be tried again for a maximum of 3 tries on the first 512 sectors of the disk and

5 tries on the remaining (inner) sectors. If the mode is "single read", no retries are attempted.

The actual difference in speed between the single and multiple read modes depends on the original disk; some types of "bad" sectors almost always give "disk timeout" errors which do not result in retries, while others act like normal read erors and force the program to go through the full 3 or 5 tries. Also, the operating system sometimes forces a retry whether the program wants it or not. In practice, the single read option is seldom more than twice as fast as multiple read.

With this in mind, you should select your operating mode as follows:

(1) If you have a newer drive with the data separator, it's reasonably safe to stay in single read mode all the time.

(2) If you have an older drive, you should stay in multiple read mode unless the number of bad sectors on your disk makes the run time unreasonably long. Toward the end of the disk, you should go to multiple read to avoid the usual inner-track errors. By the way, you can buy a data separator at many microcomputer stores for about $30 and install it yourself or have it done for another $10 or so. It's DEFINITELY worth having.

(3) Don't forget to use the "quit" option when you know you've read all the good sectors and there are hundreds of bad ones ahead of you on the disk.

You can change the read mode whenever, and as many times, as you like by pressing the "S" or "M" keys. The mode change will take effect after the next sector is read; likewise, when you press "Q" the program will stop reading and begin writing to the copy disk after reading the next sector.

To the purchaser of COPYCAT,

Software manufacturers are developing more sophisticated disk protection schemes, (i.e. unformated sectors). The 810 disk drive reads these as bad sectors, which will stop DOS from copying a disk with 144 errors.

COPYCAT was designed specifically to handle this type of software protection,

however, in most cases, the program being copied will look for these bad sectors before the program will run. If no bad sector is encountered, it will not run.
COPYCAT will produce an exact copy of the original disk however, in cases such as the above, WILL NOT PRODUCE A RUNABLE COPY.
To utilize your copy, COPYCAT allows you to repair the original, if it for some reason won't boot. You would use COPYCAT to copy a back up disk, then, transfer it back onto the original by reversing the process. You will therefor produce a new original which will boot.

CAUTION:

DO NOT FORMAT THE ORIGINAL DISK

If you were to format the disk, it would remove all of the bad sectors which the program looks for before it will run.

We repeat.....DO NOT FORMAT THE ORIGINAL.

LIMITED WARRANTY

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